Tafas v. Dudas et al
Doc. 258 Att. 22

EXHIBIT 17 (Part 1)

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PATENT
Attorney Docket No. 076376.0413

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:	)		
Toyonori SASAKI et al.	)	Examiner	To Be Assigned
Application No.: To Be Assigned	)	Group Art Unit	To Be Assigned
Filed: September 29, 2006	)	Confirmation No.	To Be Assigned
For: INK CARTRIDGES	)		

PRE-EXAMINATION SEARCH DOCUMENT

Commissioner for Patents
U.S. Patent and Trademark Office
Customer Service Window
Randolph Building
401 Dulany Street
Alexandria, VA 22314

Sir:

This Pre-Examination Search Document is provided in support of the Petition for Accelerated Examination filed herewith.

A pre-examination search was conducted involving U.S. patents and patent application publications, foreign patent documents and non-patent literature as indicated below. The results of the search are provided on an Information Disclosure Statement filed concurrently herewith.

A. Pre-examination Search

1. US Field of Search:

Classes/Subclasses Searched:

73/305, 307, 309, 317, 319, 322.5;

116/227, 228, 229;

250/573, 575;

340/603, 612, 618, 623, 625;

347/19, 85, 86, 108

401/192, 194;

Date Conducted: June 26, 2006 –July 11, 2006

2. Foreign Field of Search:

IPCs Searched:

B29C041/00;

B41J002/175;

B41J002/195;

B41J024/34;

B41J029/13;

B41J029/393;

B41J032/00;

B43L025/00;

Date Conducted: August 24, 2006 – September 13, 2006

3. Database Searches:

a. Database Service: USPTO EAST

Files Searched:

US Patent Document Databases: US-PGPUB, USPAT

Foreign Patent Document Databases: EPO, JPO, DERWENT

Search Logic:

L1 (ink and (cartridge or housing or casing or tank or enclosure or cover$3))

L2 ((ink and (cartridge or housing or casing or tank or enclosure or cover$3)) and (level$3 or indicat$4 or remain$4 or residual or detect$4)

L3 ((ink and (cartridge or housing or casing or tank or enclosure or cover$3)) and (translucent or transparent or clear)

L4 ((ink and (cartridge or housing or casing or tank or enclosure or cover$3)) and (mold$3)

L5 ((ink and (cartridge or housing or casing or tank or enclosure or cover$3)) and (air adj (inlet or outlet or supply))

L6 (ink and (cartridge or housing or casing or tank or enclosure or cover$3)) and (float$3 or buoy$4)

L7 (ink and (cartridge or housing or casing or tank or enclosure or cover$3)) and (communicat$4 or path or perpendicular or chamber$2)

L8 (ink and (cartridge or housing or casing or tank or enclosure or cover$3)) and (film or thick$5)

L8 (ink and (cartridge or housing or casing or tank or enclosure or cover$3)) and (groov$4 or recess or concave$3 slot$3)

L9 (ink and (cartridge or housing or casing or tank or enclosure or cover$3)) and (stub$3 or protru$5 or ridge or rough$4 or bend$3 or bent or rib$4)

Date Conducted: June 26, 2006 – September 13, 2006

b. Database Services: JPO NCIPI

Files Searched:

Foreign Patent Document Databases: JPO

Japanese Domestic Classification F-Terms Searched:

2C056(KC01, KC04, KC05, KC06, KC07, KC09, KC13, KC15, KC16, KC17, KC18, KC20, KC21, KC22, KC23, KC25, KC27, KC30);

2C056(KD01, KD02, KD03, KD04, KD06, KD08 and KD10);

Date Conducted: August 24, 2006 – September 13, 2006

c. Database Services: Korean Patent Office (KIPO) Kipris

Files Searched

Foreign Patent Document Database: KIPO

Search Logic:

L1 (ink * (cartridge + housing + casing + tank + enclosure + cover or covering))

L2 (ink * (cartridge + housing + casing + tank + enclosure + cover)) * (mold + molded)

L3 (ink * (cartridge + housing + casing + tank + enclosure + cover)) * (chamber + translucent + transparent + clear)

L4 (ink * (cartridge + housing + casing + tank + enclosure + cover)) * (air*inlet)

L5 (ink * (cartridge + housing + casing + tank + enclosure + cover)) * (indicating + indicator + indication + level + remain + remaining + residual)

Date Conducted: August 24, 2006 – September 13, 2006

d. Database Service: Dialog

Files Searched:

Inspec, NTIS, Ei Compendex, Gale Group PROMT, Weldasearch, Dissertation Abstracts Online, Inside Conferences, JICST-Eplus, FLUIDEX, Wilson Applied Science & Technology Abstracts, PASCAL, PIRA, Wilson Business Abstracts, Asia-Pacific Directory

Search Logic:

L1 (ink (3n) (cartridge or case or casing or tank or housing or enclosure or cover)

Date Conducted: August 24, 2006 – September 13, 2006.

e. Database Service: Google

File Searched:

Google Scholar (Non Patent Literature)

Search Logic:

L1 ink (cartridge OR casing OR case OR tank OR housing OR cover OR enclosure) (transparent OR transparent);

L2 ink (cartridge OR casing OR case OR tank OR housing OR cover OR enclosure) (residual OR level OR indicating);

Date Conducted: August 24, 2006 – September 13, 2006

f. Database Services : SCIRUS

File Searched:

Journal Sources, Websites (Non Patent Literature)

Search Logic :

L1 ink cartridge translucent;

L2 ink cartridge mold;

L3 ink cartridge residual;

L4 ink cartridge level indication;

L5 ink cartridge level monitoring;

Conducted: August 24, 2006 – September 13, 2006

g. Database Services: GWU ALADIN

File Searched:

Academic Search Premier

Search Logic:

L1 ink cartridge molding;

L2 ink cartridge level;

L3 ink cartridge residual;

L4 ink cartridge monitoring;

Conducted: August 24, 2006 – September 13, 2006

B. Search Directed to the Invention

The pre-examination search was directed to the claimed invention, encompassing all the features of the claims and giving the claims their broadest reasonable interpretation.

C. Search Directed to the Disclosure

No disclosed features that are unclaimed at this time are currently seen as features that may be claimed later.

D. Search Report from a Foreign Patent Office

No search report from a foreign patent office is provided here as the pre-examination search.

E. Statement of Good Faith

All statements above in support of the petition to make special are based on a good faith belief that the search was conducted in compliance with the requirements of this rule.

Respectfully submitted,

BAKER BOTTS L.L.P.

Dated: September 29, 2006

By: [signature]
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JBA/TJC/tt

PTO/SB/08a (08-03)
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	
	Filing Date	2006-09-29
	First Named Inventor	Shingo HATTORI et al.
	Art Unit	
	Examiner Name	
	Attorney Docket Number	076376.0413

U.S.PATENTS

Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	6796627	B2	2004-09-28	KIMURA ET AL.	Entire Document and Accelerated Examination Support Document

If you wish to add additional U.S. Patent citation information please click the Add button. Add

U.S.PATENT APPLICATION PUBLICATIONS

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Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20050068389	A1	2005-03-31	KATAYAMA ET AL.	Entire Document and Accelerated Examination Support Document

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FOREIGN PATENT DOCUMENTS

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Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1	8281966	JP	A	1996-10-29	TAMIO	Abstract and Accelerated Examination Support Document	☐
	2	200434406	JP	A	2004-02-05	ISAO	Abstract and Accelerated Examination Support Document	☐
	3	7314716	JP	A	1996-12-05	HIROSHI ET AL.	Abstract and Accelerated Examination Support Document	☐

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	Art Unit	
	Examiner Name	
	Attorney Docket Number	076376.0413

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NON-PATENT LITERATURE DOCUMENTS Remove

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T5
	1		☐

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EXAMINER SIGNATURE

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**	Application Number	
	Filing Date	2006-09-29
	First Named Inventor	Shingo HATTORI et al.
	Art Unit	
	Examiner Name	
	Attorney Docket Number	076376.0413

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☐ Fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☑ None

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Timothy J. Churna/	Date (YYYY-MM-DD)	2006-09-29
Name/Print	Timothy J. Churna	Registration Number	48340

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

PATENT
Attorney Docket No. 076376.0413

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:	)		
Toyonori SASAKI et al.	)	Examiner	To Be Assigned
Application No.: To Be Assigned	)	Group Art Unit	To Be Assigned
Filed: September 29, 2006	)	Confirmation No.	To Be Assigned
For: INK CARTRIDGES	)		

ACCELERATED EXAMINATION SUPPORT DOCUMENT

Commissioner for Patents
U.S. Patent and Trademark Office
Customer Service Window
Randolph Building
401 Dulany Street
Alexandria, VA 22314

Sir:

This accelerated examination support document is provided in support of the petition for accelerated examination filed herewith.

Identification of the Limitations of the Claims Disclosed by the Cited References begins on page 2 of this paper.

Detailed Explanation of Patentability begins on Page 9 of this paper.

Statement of Utility begins on Page 10 of this paper.

Showing of Support of Each Claim Limitation begins on page 11 of this paper.

Conclusion begins on page 14 of this paper.

Identification of the Limitations of the Claims Disclosed by the Cited References:

1. Japanese Patent Publication No. JP-8281966

a. Independent Claim 1

Japanese Patent Publication No. JP-8281966 ("JP '966") describes an ink cartridge 21 (Figures 2 and 3) including a first wall (not numbered, but shown in Figure 2), a second wall (not numbered, but shown in Figures 2 and 3) which is perpendicular to the first wall and is connected to the first wall, and an ink supply portion 29 (Figure 2) which extends from an end of the first wall of ink cartridge 21. Ink cartridge 21 also includes a translucent portion 31 (Figures 2 and 3) which extends from an end of the second wall of ink cartridge, and translucent portion 31 has an inner space defined therein. Moreover, ink cartridge 22 includes an ink chamber 24-25 (Figure 2), and a movable member (not numbered, but shown in Figures 2 and 3) including a float 34 and a light blocking portion 33. The movable member is configured to selectively be positioned within and outside the inner space of translucent portion 31 based on the amount of ink within ink chamber 24-25, and float 34 and light blocking portion 33 move together and in the same direction.

Independent claim 1 is not anticipated by JP '966 at least because JP '966 does not disclose (a) a rotatable member including a pivot portion; (b) a support member connected to the rotatable member; (c) that the float portion is positioned between the signal blocking portion and the pivot portion; or (d) that the ink supply portion and the translucent portion are positioned at the same wall of the ink cartridge.

b. Dependent Claim 2

JP '966 states that that as ink is dispensed from ink chamber 24-25, the surface of the ink, float 34, and light blocking portion 33 move in the same direction.

Dependent claim 2 is not anticipated by JP '966 at least because JP '966 does not disclose that as ink is dispensed from the ink chamber, the surface of the ink moves in a first direction, and the float portion and the signal blocking portion move in a second direction which is slanted with respect to the first direction.

c. Dependent Claim 3

Dependent claim 3 is not anticipated by JP '966 at least because JP '966 does not disclose the support member connected to the rotatable member.

In view of the foregoing remarks, claims 1-3 are not anticipated by JP '966 because JP '966 does not disclose each and every limitation of these claims, and claim 4 is not anticipated by JP '966 because claim 4 depends from independent claim 1.

2. Japanese Patent Publication No. JP-2004-34406

a. Independent Claim 1

Japanese Patent Publication No. JP-2004-34406 ("JP '406") states that an ink cartridge 4, e.g., ink cartridges 4k, 4c, 4m, 4y Figure 1, including an ink chamber (not numbered, but shown in Figure 3). The ink chamber includes a first wall (not numbered, but shown in Figure 3) and a second wall parallel with and opposite to the first wall. Each of the first wall and the second wall have a first end and a second end opposite the first end, and at least a portion of the first wall is translucent. Ink cartridge 4 also includes an ink supply portion (not numbered, but shown in Figure 3) positioned at the second wall, which has an opening formed therethrough. Moreover, ink cartridge 4 includes a pivotable float 12 which is disposed within the ink chamber and is configured to deflect light. Float 4 is configured to move between a first position and a second position based at least on an amount of ink disposed within the ink chamber, and the position of float 12 may be detected by an optical detecting means 20. Specifically, as the ink within the ink chamber is dispensed from the interior of the ink chamber to the exterior of the ink chamber, a surface of the ink within the ink chamber moves in a first direction, and float 4 pivots and moves in a second direction which is slanted with respect to the first direction.

Independent claim 1 is not anticipated by JP '406 at least because JP '406 does not disclose (a) that the float portion is positioned between the signal blocking portion and the pivot portion; or (b) that the ink supply portion and the translucent portion are positioned at the same wall of the ink cartridge.

b. Dependent Claim 3

JP '406 states that that the float portion and the signal blocking portion are the same portion.

Dependent claim 3 is not anticipated by JP '406 at least because JP '406 does not disclose that the float portion is positioned closer to the second wall than the signal blocking portion is positioned to the second wall.

In view of the foregoing remarks, claims 1 and 3 are not anticipated by JP '406 because JP '406 does not disclose each and every limitation of these claims, and claims 2 and 4 are not anticipated by JP '406 because claims 2 and 4 depend from independent claim 1.

3. Japanese Patent Publication No. JP-7314716

a. Independent Claim 1

Japanese Patent Publication No. JP-7314716 ("JP '716") describes an ink cartridge 22 (Figure 2) including a case (not numbered, but shown in Figure 1) including a wall (not numbered, but shown in Figure 2). Ink cartridge 22 also includes a translucent portion (not numbered, but shown in Figure 2) and an ink supply portion 36 (Figure 2) which are positioned at the wall of ink cartridge 22, and an ink chamber 23-26 (Figure 2). Moreover, ink cartridge 22 includes a movable member 31 (Figure 2). Specifically, movable member 31 has a light blocking portion and a float portion opposite the light blocking portion, and movable member 31 is configured to selectively be positioned within and outside the inner space of the translucent portion based on the amount of ink within ink chamber 23-26.

Independent claim 1 is not anticipated by JP '716 at least because JP '716 does not disclose (a) a rotatable member including a pivot portion; (b) a support member connected to the rotatable member; or (c) that the float portion is positioned between the signal blocking portion and the pivot portion.

b. Dependent Claim 2

Dependent claim 2 is not anticipated by JP '716 at least because JP '716 does not disclose that as ink is dispensed from the ink chamber, the surface of the ink moves in a first direction, and the float portion and the signal blocking portion move in a second direction which is slanted with respect to the first direction.

c. Dependent Claim 3

Dependent claim 3 is not anticipated by JP '716 at least because JP '716 does not disclose the support member connected to the rotatable member.

In view of the foregoing remarks, claims 1-3 are not anticipated by JP '716 because JP '716 does not disclose each and every limitation of these claims, and claim 4 is not anticipated by JP '716 because claim 4 depends from independent claim 1.

4. Patent No. US 6,796,627 B2 to Kimura et al.

a. Independent Claim 1

Patent No US 6,796,627 B2 to Kimura et al. ("Kimura") describes an ink jet recording apparatus (not numbered, but shown in Figure 14) including a tank 7 (Figure 14) which includes a wall (not numbered, but shown in Figure 14). The ink jet recording apparatus also includes an ink supply portion (not numbered, but shown in Figure 14), and a float 31 (Figure 14) which is configured to move within the inner space of tank 7 based on the amount of ink within tank 7 via a pivot 44 (Figure 8) positioned at an end of float 31. Specifically, float 31 includes a magnet 32 (Figure 14) which is aligned with Hall devices 33 (Figure 14), and when ink is removed from tank 7, magnet 32 moves down and away from Hall devices 33, such that Hall devices detect a change in electrical output.

Independent claim 1 is not anticipated by Kimura at least because Kimura does not disclose (a) a translucent portion; (b) a signal blocking portion; (c) a support member; (d) that the ink supply portion and the translucent portion are positioned at the same wall of the ink cartridge; or (e) that the float portion is positioned between the pivot portion and the signal blocking portion.

b. Dependent Claim 2

Dependent claim 2 is not anticipated by Kimura at least because Kimura does not disclose a signal blocking portion.

c. Dependent Claim 3

Dependent claim 3 is not anticipated by Kimura at least because Kimura does not disclose a signal blocking portion or a support member.

In view of the foregoing remarks, claims 1-3 are not anticipated by Kimura because Kimura does not disclose each and every limitation of these claims, and claim 4 is not anticipated by Kimura because claim 4 depends from independent claim 1.

5. U.S. Patent Application Publication No. US 2005/0068389 A1

a. Independent Claim 1

U.S. Patent Application Publication No. US 2005/0068389 A1 to Katayama et al. ("Katayama") describes an ink cartridge 103 (Figures 12 and 14) including a first wall (not numbered, but shown in Figure 14), a second wall (not numbered, but shown in Figure 14) which is perpendicular to the first wall and is connected to the first wall, and an ink supply portion 121 (Figure 14) which extends from the first wall of ink cartridge 103. Ink cartridge 103 also includes a translucent portion 134 (Figures 12 and 14) which extends from the second wall of ink cartridge 103 and has an inner space defined therein. Moreover, ink cartridge 103 includes an ink chamber 131 (Figure 14), and a movable member 123 (Figure 14) which includes a float portion 161 positioned at a first end of movable member 123 and a signal blocking portion 160 positioned at a second end of movable member 123. Signal blocking portion 160 is disposed within and configured to move within the inner space of translucent portion 134 based on the amount of ink within ink chamber 131, and movable member 123 is supported by a support portion 163 (Figure 14) connected to a bottom wall of ink chamber 131, such that movable member 123 pivots about support portion 163.

Independent claim 1 is not anticipated by Katayama at least because Katayama does not disclose (a) that the ink supply portion and the translucent portion are positioned at the same wall of the ink cartridge; or (b) that the float portion is positioned between the pivot portion and the signal blocking portion.

b. Dependent Claim 2

Dependent claim 2 is not anticipated by Katayama at least because Katayama does not disclose that the signal blocking portion and the float portion move in the same direction.

In view of the foregoing remarks, claims 1 and 2 are not anticipated by Katayama because Katayama does not disclose each and every limitation of these claims, and claims 3 and 4 are not anticipated by Katayama because claims 3 and 4 depend from independent claim 1.

Detailed Explanation of Patentability:

1. 35 U.S.C. § 102

Applicants respectfully submit that for at least the reasons set forth above, none of JP '966, JP '406, JP '716, Kimura, and Katayama anticipates any of claims 1-4 of the above-captioned patent application under 35 U.S.C. § 102(a)-(g) at least because none of these references discloses each and every limitation of any of claims 1-4. MPEP 2131.

2. 35 U.S.C. § 103(a)

In order to establish a prima facie case of obviousness, at least three criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to those of ordinary skill in the art, to modify the primary reference to achieve the claimed invention. Second, there must be a reasonable expectation of success. Third, the prior art references must disclose all the claim limitations. MPEP 2143. Applicants respectfully submit that none of JP '966, JP '406, JP '716, Kimura, and Katayama, either alone or in combination, renders claims 1-4 of the above-captioned patent application obvious under 35 U.S.C. §103(a) at least because none of these references discloses or suggests that the float portion is positioned between the pivot portion and the signal blocking portion.

Statement of Utility:

The present invention, as set forth in independent claim 1, may be used to deliver ink to a recording medium, such as paper.

PATENT
Attorney Docket No. 076376.0413

Showing of Support of Each Claim Limitation:

CLAIM LIMITATION	SUPPORT FOR CLAIM LIMITATION
1. An ink cartridge, comprising: an ink chamber comprising a first wall having a first end and a second end opposite the first end, and a second wall which is substantially perpendicular to the first wall and is connected to the second end of the first wall;	At least Paragraphs
a translucent portion positioned at the first wall, wherein the translucent portion is configured to be in fluid communication with the ink chamber, and the translucent portion has an inner space formed therein;	At least Paragraphs
an ink supply portion having an opening formed therethrough, wherein the ink supply portion is positioned at the first wall adjacent to the second end of the first wall, and the translucent portion is positioned between the first end of the first wall and the ink supply portion;	At least Paragraphs
a support member; and	At least Paragraph
a rotatable member connected to the support member, wherein the rotatable member comprises:	At least Paragraphs
a pivot portion formed at a point of connection between the support member and the rotatable member;	At least Paragraphs

a signal blocking portion, wherein the signal blocking portion is disposed within the inner space of the translucent portion; and	At least Paragraphs
a float portion disposed within the ink chamber, wherein the float portion is positioned between the signal blocking portion and the pivot portion, and the float portion is configured to move between a first position and a second position based at least on an amount of ink disposed within the ink chamber.	At least Paragraphs
2. The ink cartridge of claim 1, wherein as the ink within the ink chamber is dispensed from the interior of the ink chamber to the exterior of the ink chamber a surface of the ink within the ink chamber moves in a first predetermined direction, and when the float portion moves from the first position to the second position each of the float portion and the signal blocking portion moves about the pivot in a second predetermined direction which is slanted with respect to the first predetermined direction.	At least Paragraphs
3. The ink cartridge of claim 1, wherein the support member is connected to the second wall, and the float portion is positioned closer to the second wall than the signal blocking portion is positioned to the second wall.	At least Paragraphs

4. The ink cartridge of claim 1, further comprising a communication path configured to dispense ink from an interior of the ink chamber to an exterior of the ink chamber via the opening formed through the ink supply portion, wherein the float portion is unaligned with a center line of the communication path when the float portion is in the first position or the second position.	At least Paragraphs

Thus, claims 1-4 satisfy the requirements of 35 U.S.C. § 112, ¶1.

Conclusion:

In view of this Accelerated Support Document, Applicants respectfully request that the Examiner grant the Petition for Accelerated Examination in the above-captioned patent application. Applicants respectfully submit that the claims of the above-captioned patent application are in condition for allowance, and respectfully request that the Examiner allow the claims of the above-captioned patent application to issue in a U.S. patent.

Respectfully submitted,
BAKER BOTTS L.L.P.

Dated: September 29, 2006

By: ____________________
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JBA/TJC/tt

CLAIMS:

What is Claimed is:

1. An ink cartridge, comprising:

an ink chamber comprising a first wall having a first end and a second end opposite the first end, and a second wall which is substantially perpendicular to the first wall and is connected to the second end of the first wall;

a translucent portion positioned at the first wall, wherein the translucent portion is configured to be in fluid communication with the ink chamber, and the translucent portion has an inner space formed therein;

an ink supply portion having an opening formed therethrough, wherein the ink supply portion is positioned at the first wall adjacent to the second end of the first wall, and the translucent portion is positioned between the first end of the first wall and the ink supply portion;

a support member; and

a rotatable member connected to the support member, wherein the rotatable member comprises:

a pivot portion formed at a point of connection between the support member and the rotatable member;

a signal blocking portion, wherein the signal blocking portion is disposed within the inner space of the translucent portion; and

a float portion disposed within the ink chamber, wherein the float portion is positioned between the signal blocking portion and the pivot portion, and the float portion is configured to move between a first position and a second position based at least on an amount of ink disposed within the ink chamber.

2. The ink cartridge of claim 1, wherein as the ink within the ink chamber is dispensed from the interior of the ink chamber to the exterior of the ink chamber a surface of the ink within the ink chamber moves in a first predetermined direction, and when the float portion moves from the first position to the second position each of the float portion and the signal blocking portion moves about the pivot in a second predetermined direction which is slanted with respect to the first predetermined direction.

3. The ink cartridge of claim 1, wherein the support member is connected to the second wall, and the float portion is positioned closer to the second wall than the signal blocking portion is positioned to the second wall.

4. The ink cartridge of claim 1, further comprising a communication path configured to dispense ink from an interior of the ink chamber to an exterior of the ink chamber via the opening formed through the ink supply portion, wherein the float portion is unaligned with a center line of the communication path when the float portion is in the first position or the second position.

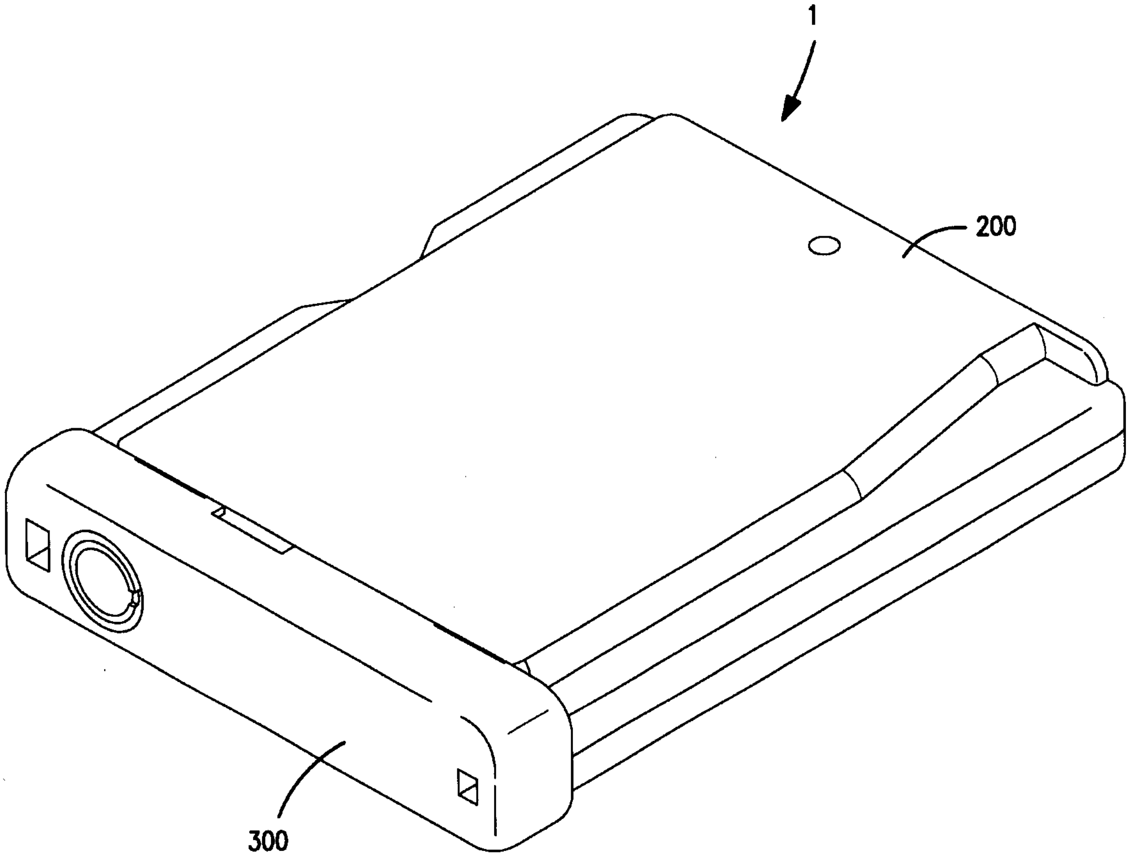

FIGURE 1

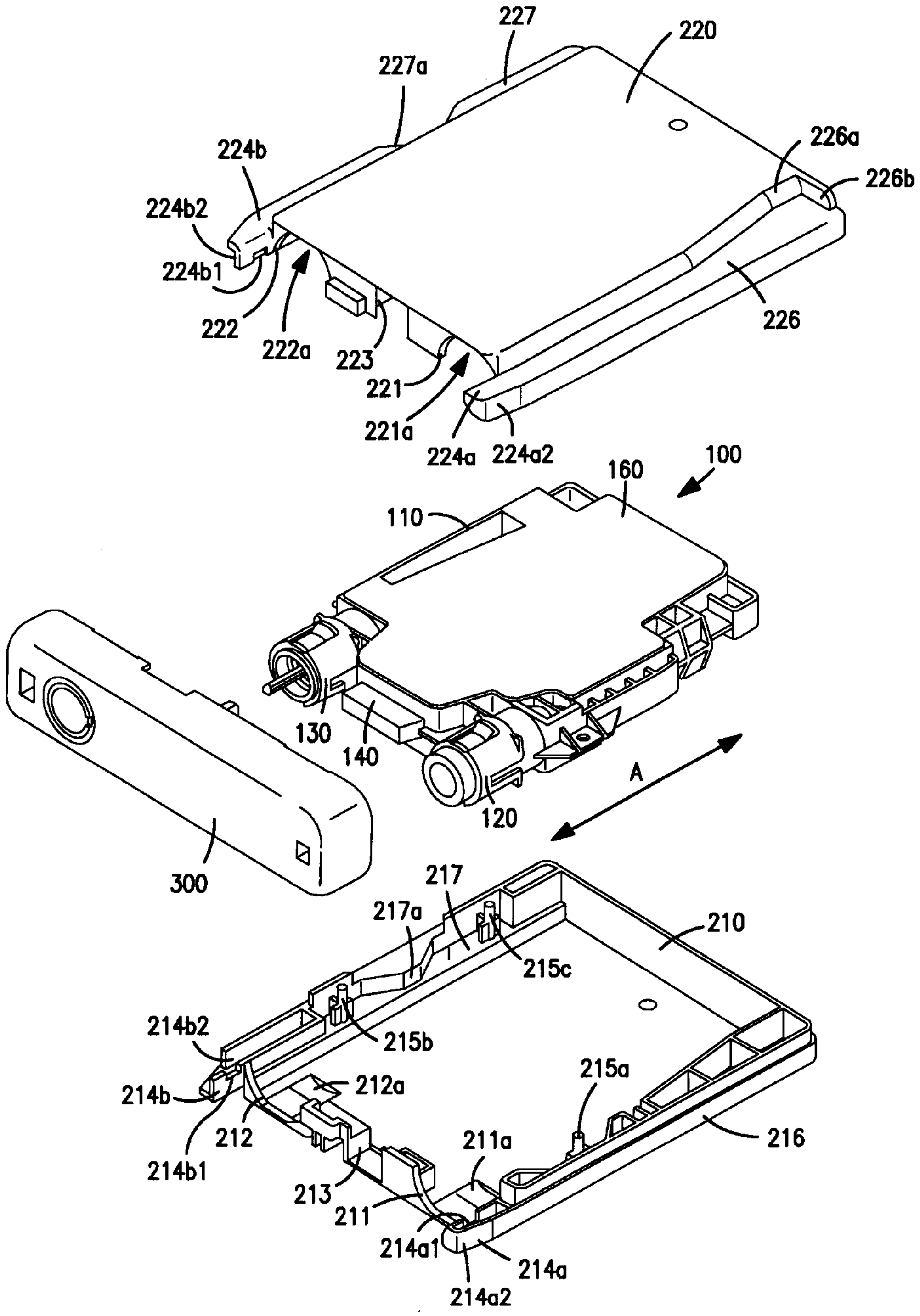
227
220
227a
226a
224b
226b
224b2
224b1
226
222
222a
223
221
221a
224a
224a2
160
100
110
130
140
A
120
300
217
217a
210
215c
214b2
215b
214b
212a
215a
212
216
214b1
211a
213
211
214a1
214a
214a2

FIGURE 2

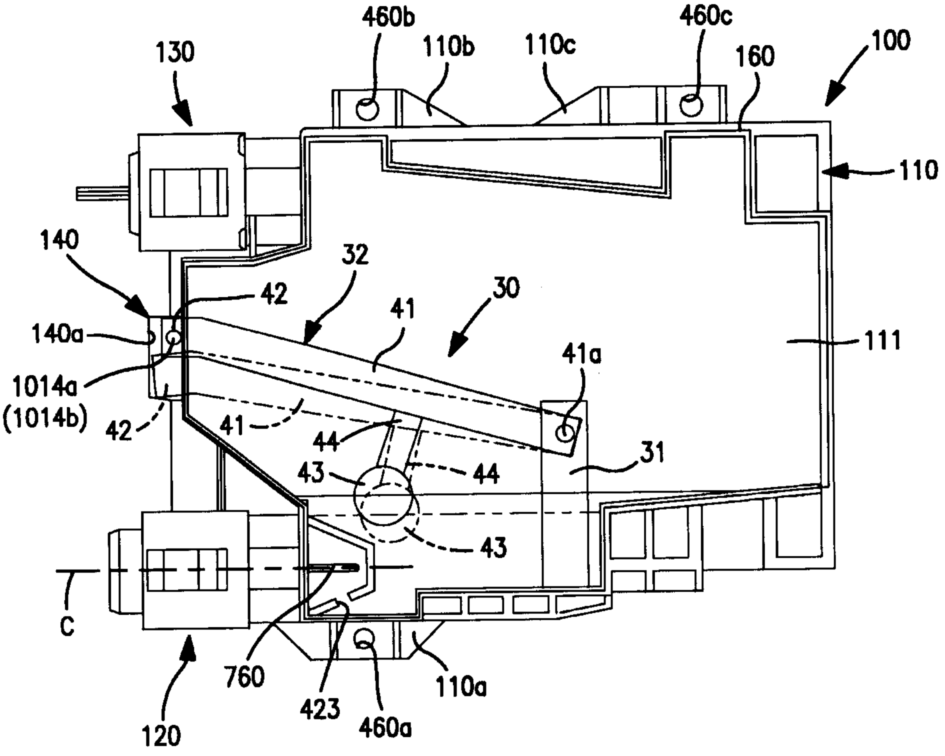
460b
110b
110c
460c
160
100
130
110
140
32
30
42
41
140a
111
41a
1014a
(1014b)
42
41
44
31
43
44
43
C
760
110a
423
460a
120

FIGURE 3

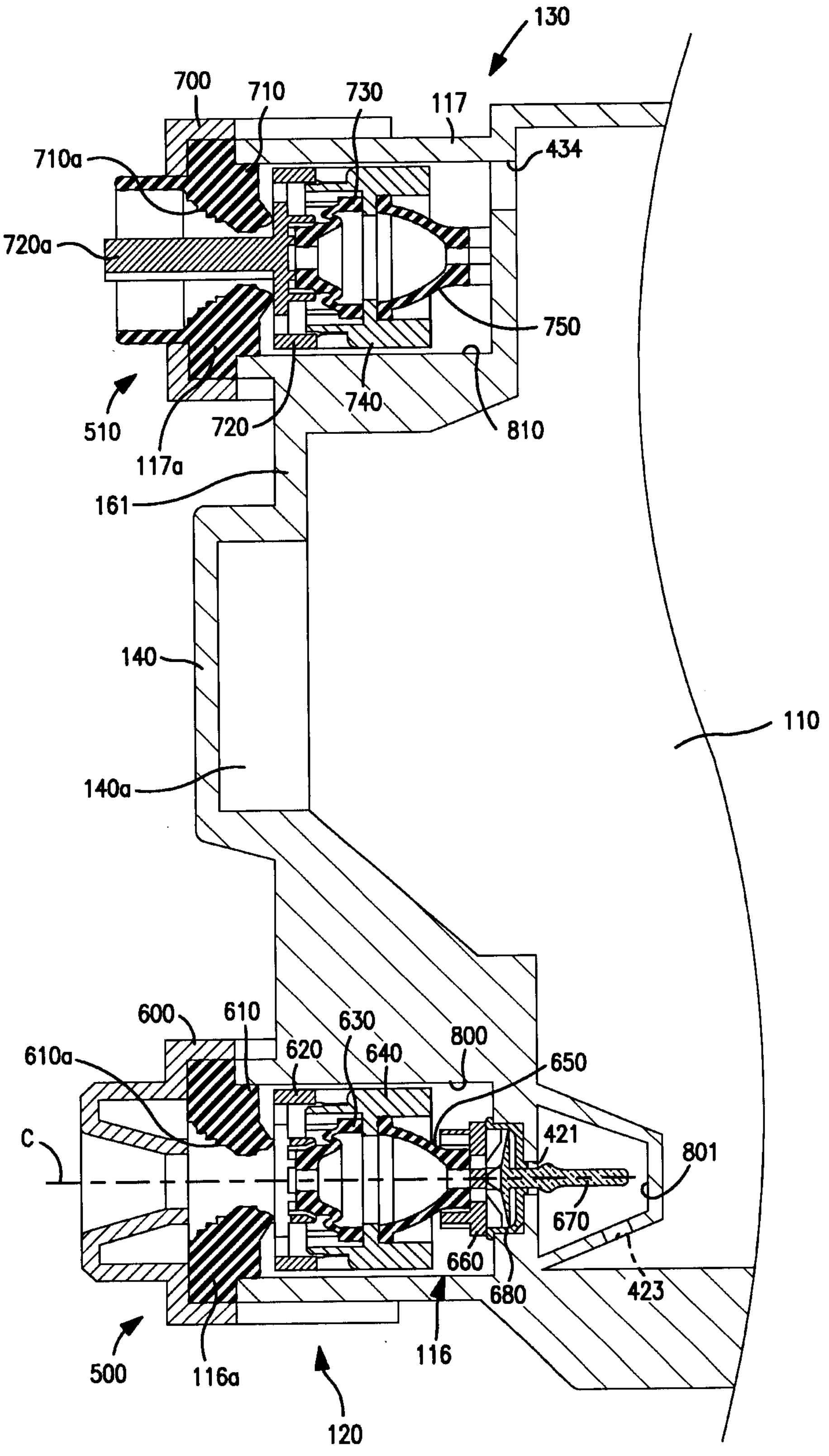
130
700
710
730
117
710a
434
720a
750
510
720
740
810
117a
161
140
110
140a
600
610
630
610a
620
640
800
650
C
421
801
670
660
680
423
500
116a
116
120

FIGURE 4

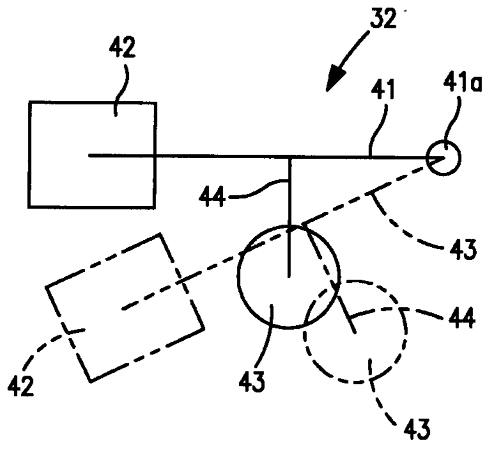
32
42
41
41a
44
43
44
42
43
43

FIGURE 5(a)

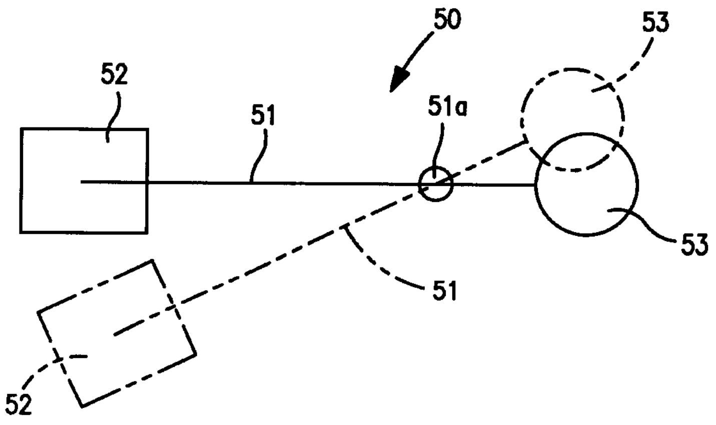
50
53
52
51
51a
53
51
52

FIGURE 5(a)
PRIOR ART

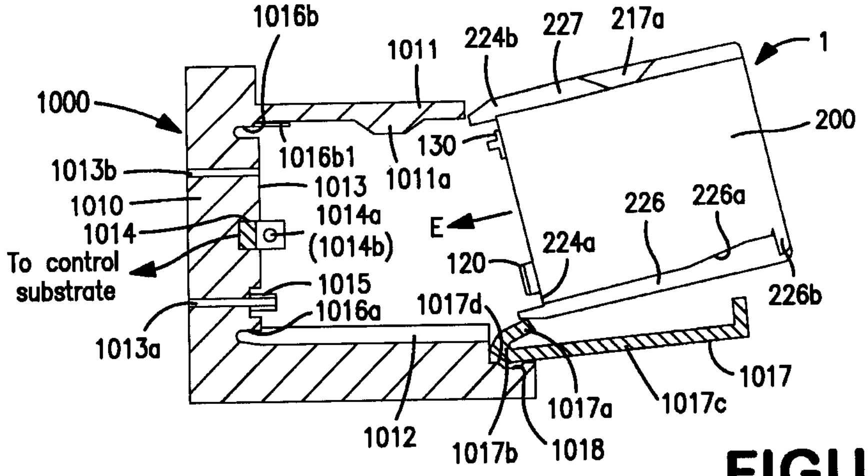
1016b
1011
224b
227
217a
1
1000
200
1016b1
130
1011a
1013b
1013
1010
1014a
1014
(1014b)
E
To control substrate
226
226a
120
224a
1015
1016a
1017d
226b
1013a
1017
1017a
1017c
1012
1017b
1018

FIGURE 6(a)

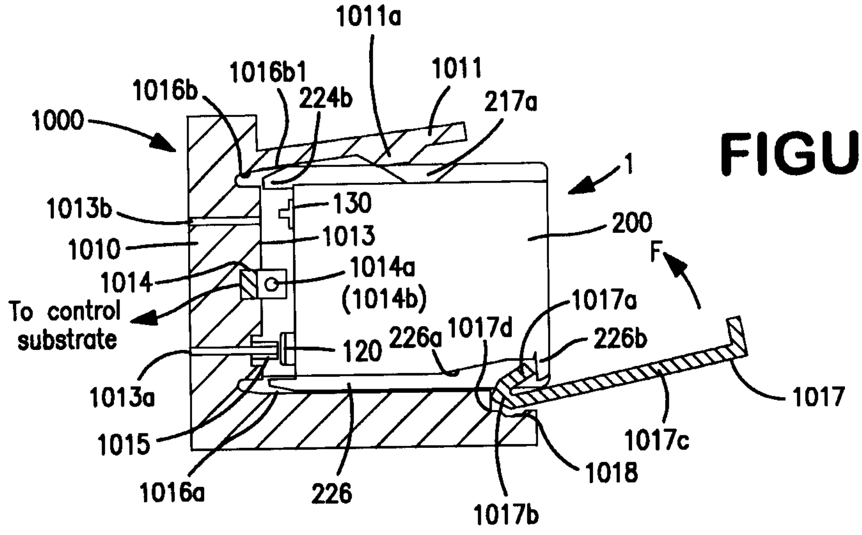
1011a
1016b1
1011
1016b
224b
217a
1000
1
130
1013b
200
1013
1010
F
1014a
1014
(1014b)
To control substrate
1017a
120
226a
1017d
226b
1013a
1017
1015
1017c
1018
1016a
226
1017b

FIGURE 6(b)

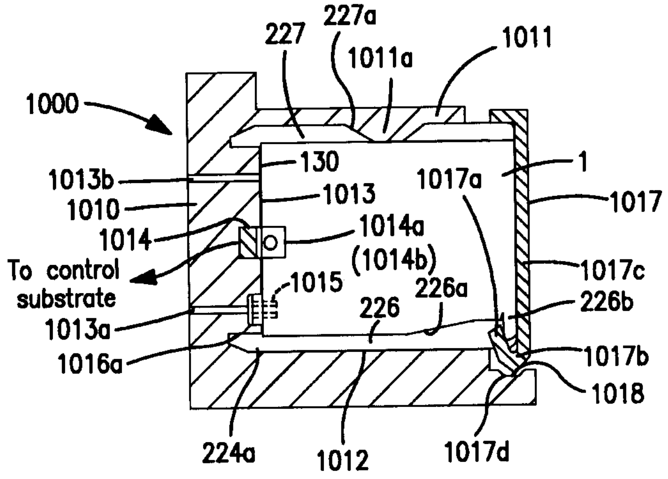
227a
227
1011a
1011
1000
130
1
1013b
1017a
1013
1017
1010
1014a
1014
(1014b)
To control substrate
1017c
1015
226a
226
226b
1013a
1017b
1016a
1018
224a
1012
1017d

FIGURE 6(c)

INK CARTRIDGES

ABSTRACT OF THE DISCLOSURE

An ink cartridge includes a support member, and a rotatable member connected to the support member. The rotatable member includes a pivot portion formed at a point of connection between the support member and the rotatable member, and a signal blocking portion. The signal blocking portion is disposed within an inner space of a translucent portion. The rotatable member also includes a float portion disposed within an ink chamber. The float portion is positioned between the signal blocking portion and the pivot portion, and the float portion is configured to move between a first position and a second position based at least on an amount of ink disposed within the ink chamber. Specifically, as the ink within the ink chamber is dispensed from the interior of the ink chamber to the exterior of the ink chamber a surface of the ink within the ink chamber moves in a first predetermined direction, and when the float portion moves from the first position to the second position each of the float portion and the signal blocking portion moves about the pivot in a second predetermined direction which is slanted with respect to the first predetermined direction.

PATENT
Attorney Docket No. 076376.0413

INK CARTRIDGES

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] The present application claims priority from Japanese Patent Application No. JP-2006-088204, which was filed on March 28, 2006, and U.S. Provisional Patent Application No. 60/826,254, which was filed on September 20, 2006, the disclosures of which are incorporated herein by reference in their entirety.

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0002] The present invention relates generally to ink cartridges. In particular, the present invention directed towards ink cartridges which may be used in combination with ink jet printers

2. Description of Related Art

[0003] Ink cartridges which are configured to be used in combination with ink jet printers are known in the art. In such known ink cartridges, it is possible to detect when the amount of ink in the ink cartridge is relatively low. For example, one known ink cartridge comprises a shutter mechanism which functions as a light-blocking portion, and a float on both edges of a level which is supported in the central portion of the ink reservoir element, such that it rotates about a support in the extender direction at the bottom of the ink reservoir element. Specifically, when there is a relatively large amount of ink in the ink reservoir element, the level will rotate due to an upwards movement of the float caused by buoyancy, thereby positioning the shutter near the bottom of the concave portion of the ink reservoir element, such that the shutter blocks the light that is emitted from a light emitting portion of an optical sensor. When the ink is removed from the ink reservoir element, the float drops and the level rotates, resulting in the shutter being positioned near the top portion of the concave portion, thereby stopping the blockage of light emitted from the light emitting portion. At this time, the light receiving portion of the optical sensor receives the light, and detects that the ink reservoir element is empty.

[0004] Nevertheless, in this known ink cartridge, a relatively large shutter mechanism is employed, and the shutter and the float are positioned on both edges of the level which is supported by the support member, which increases the size of the ink cartridge needed to house the shutter mechanism.

SUMMARY OF THE INVENTION

[0005] Therefore, a need has arisen for ink cartridges which overcome these and other problems associated with the related art. A technical advantage of the present invention is that the ink cartridge may detect when the ink reservoir element is substantially empty without increasing the size of the ink cartridge.

[0006] According to embodiment of the present invention, an ink cartridge comprises an ink chamber comprising a first wall having a first end and a second end opposite the first end, and a second wall which is substantially perpendicular to the second wall and is connected to the second end of the first wall. The ink cartridge also comprises a translucent portion positioned at the first wall. The translucent portion is configured to be in fluid communication with the ink chamber, and the translucent portion has an inner space formed therein. The ink cartridge also comprises an ink supply portion having an opening formed therethrough, and the ink supply portion is positioned at the first wall adjacent to the second end of the wall, and the translucent portion is positioned between the first end of the first wall and the ink supply portion. Moreover, the ink cartridge comprises a support member which may be connected to the second wall, and a rotatable member connected to the support member. The rotatable member comprises a pivot portion formed at a point of connection between the support member and the rotatable member, and a signal blocking portion. The signal blocking portion is disposed within the inner space of the translucent portion. The rotatable member also comprises a float portion disposed within the ink chamber. The float portion is positioned between the signal blocking portion and the pivot portion, the float portion is positioned closer to the second wall than the signal blocking portion, and the float portion is configured to move between a first position and a second position based at least on an amount of ink disposed within the ink chamber. For example, in an embodiment of the present invention, as the ink within the ink chamber is dispensed from the interior of the ink chamber to the exterior of the ink chamber a surface of the ink within the ink chamber moves in a first predetermined direction, and when the float portion moves from the first position to the second position each of the float portion and the signal blocking portion moves about the pivot in a second predetermined direction which is slanted with respect to the first predetermined direction.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] For a more complete understanding of the present invention, the needs satisfied thereby, and the features and technical advantages thereof, reference now is made to the following descriptions taken in connection with the accompanying drawings.

[0008] Figure 1 is a perspective view of an ink cartridge, according to an embodiment of the present invention.

[0009] Figure 2 is an expanded, perspective view of the ink cartridge of Figure 1, according to an embodiment of the present invention.

[0010] Figure 3 is a side view of an ink reservoir element of the ink cartridge of Figure 2, according to an embodiment of the present invention.

[0011] Figure 4 is a partial, expanded diagram of the ink reservoir element of Figure 3, according to an embodiment of the present invention.

[0012] Figure 5(a) is a schematic diagram of an rotating member of the ink reservoir element of Figure 3, according to an embodiment of the present invention.

[0013] Figure 5(b) is a schematic diagram of a known rotating member.

[0014] Figures 6(a)-6(c) are diagrams showing how to install the ink cartridge of Figure 1 into a printer, according to an embodiment of the present invention.

DETAILED DESCRIPTION OF EMBODIMENTS

[0015] Embodiments of the present invention and their features and technical advantages may be understood by referring to Figures 1-6, like numerals being used for like corresponding portions in the various drawings.

[0016] Referring to Figures 1 and 2 an ink cartridge 1 according to the embodiment of the present invention is depicted. Ink cartridge 1 may comprise an ink reservoir element 100 which is configured to store ink, e.g., a light-permeable ink, an outer case 200 which covers the entirety of the ink reservoir element 100, and a protector 300 which is attached to outer case 200 and protects ink reservoir element 100 when transporting ink cartridge 1. In this embodiment of the present invention, ink reservoir element 100, outer case 200, and protector 300 may comprise a resin material, such as nylon, polyethylene, polypropylene, or the like.

[0017] Outer case 200 may comprise a first case member 210 and a second case member 220, which sandwich ink reservoir element 100 from the top and the bottom. First case member 210 may cover the lower side of ink reservoir element 100, and second case member 220 may cover the upper side of the ink reservoir element 100. First and second case members 210 and 220 may comprise a resin material, and may be manufactured using an injection molding.

[0018] First case member 210 may have a pair of case cut-out portions 211 and 212 formed therethrough which expose ink supply portion 120 and air intake portion 130, respectively, to the outside of outer case 200. Case cut-out portions 211 and 212 each may have a half-circle shape, and case cut-out portion 211 may be a cut-out corresponding to ink supply portion 120 and case cut-out portion 212 may be a cut-out corresponding to air intake portion 130. Moreover, a case cut-out portion 213 may be formed between case cut-out portion 211 and the case cut-out portion 212, and may be formed in a rectangular shape. Case cut-out portion 213 may be a cut-out for insertion of optical sensor 1014 to a position in which optical sensor 1014 sandwiches translucent portion 140. A contact groove 211a may be formed on the inner side surface that is connected with case cut-out portion 211 of first case member 210, and contact groove 211a may contact ink supply portion 120. Similarly, a contact groove 212a may be formed on the inner side surface that is connected with case cut-out portion 212 of first case member 210, and contact groove 212a may contact air intake portion 130. By using contact grooves 211a and 212a, first case member 210 readily may be aligned.

[0019] First case member 210 also may comprise two case protrusion portions 214a and 214b that protrude in the protector 300 direction from the surface where case cut-out portions 211–213 are formed. Case protrusion portions 214a and 214b may be formed on both sides of first case member 210, such that they sandwich case cut-out portions 211–213. Case protrusion portion 214a may have a sloped surface 214a2 that is sloped in the case cut-out portions 211–213 direction towards the edge from the portion that is connected to the side wall of first case member 210. When installing ink cartridge 1 into printer 1000, the installation may be made with case protrusion portion 214a on the lower side. Therefore, when installing ink cartridge 1, when sloped surface 214a2 is in contact with the lower portion of printer 1000, ink cartridge 1 may be smoothly introduced into a predetermined attachment position.

[0020] Further, a case protrusion cut-out portion 214b1 may be formed in case protrusion portion 214b on the inner side surface which is the case cut-out portion 211–213 side, and case protrusion cut-out portion 214b1 may be formed in a rectangular shape. A case mating groove 214b2, which may mate with the mating rod 1016b1 when ink cartridge 1 is installed in printer 1000, may be formed in case protrusion portion 214b.

[0021] Moreover, a rod component 215a may be formed on first case member 210 to align ink reservoir element 100, which protrudes in the second case member 220 direction near the side wall of the first case component 210 on the ink supply portion 120 side, and a pair of rod components 215b and 215c may be formed to align ink reservoir element 100, which protrude to the second case member 220 side near the side wall of the first case component 210 on the air intake portion 130 side. Because alignment of ink reservoir element 100 may be performed at the three locations associated with rod components 215a–215c, it may be possible to prevent incorrect attachment of ink reservoir element 100.

[0022] Within second case member 220, as in case member 210, not only may there be three case cut-out portions 221–223, there may be a contact groove 221a that is connected to case cut-out portion 221, and a contact groove 222a that is connected to the case cut-out portion 222. Moreover, on both sides of case cut-out portions 221–223, there may be case protrusion portions 224a and 224b, and case protrusion portion 224a may have a sloped surface 224a2 which is sloped in the case cut-out portion 221–223 direction towards the edge from the portion that is connected to the side surface of second case member 220. Further, in case protrusion portion 224b, there may be a case protrusion cut-out portion 224b1 with the same construction as case protrusion cut-out portion 214b1, and a case mating groove 224b2 formed that extends over the side surface of second case member 220 from the edge of case protrusion portion 224b. Within second case member 220, there may be a mating hole portion (not shown) having a hole for mating rod components 215a–215c.

[0023] First and second case members 210 and 220 may have a concave shape with both side surfaces in the direction that intersects the longitudinal direction A, and there may be a step formed with respect to the surface of first and second case members 210 and 220. In this stepped portion, first and second case members 210 and 220 may be attached, and ink reservoir element 110 may be fixed with respect to external case 200. The stepped portion on the ink supply portion 120 side may be the first case attachment portion 216 and 226, and the stepped portion on the air intake portion 130 side may be the second case attachment portion 217 and 227.

[0024] First case attachment portion 226 may be connected to the same planar surface as case protrusion portion 224a, a concave portion 226a may have a concave shape in the inner direction of second case component 220 on the opposite side to case protrusion portion 224a, and a mating portion 226b may mate with a engaging member 1017 when ink cartridge 1 is installed in printer 1000. Concave portion 226a is a region that allows movement of engaging member 1017 when the engaging member 1017 moves. Case attachment portion 227 may comprise a locking portion 227a which has a concave shape at a central position in the longitudinal direction of second case component 220, and locking portion 227a may be a portion which locks ink cartridge 1 when ink cartridge 1 is installed in printer 1000.

[0025] Although not discussed in detail, within first case component 210, there also may be a concave portion 216a, a mating portion 226b, and a locking portion 217a having substantially the same shape as concave portion 226a, mating portion 226b, and locking portion 227a, respectively, of second case member 220.

[0026] Referring to Figures 3–5, ink reservoir 100 now is described. When ink cartridge 1 is installed in printer 1000, ink supply portion 120, air intake portion 130, and translucent portion 140 may be positioned on the side surface, in which ink supply portion 120 is positioned on the lower side, and air intake portion 130 is positioned on the top side. Moreover, in Figure 3, the outer boundaries of side plate 160 are shown using a bold line, and the positions of light emitting portion 1014a and light receiving portion 1014b when ink cartridge 1 is installed in printer 1000 are shown using a dashed line.

[0027] In an embodiment of the present invention, ink reservoir 100 may comprise an ink chamber 111 and a communication path 116 within rectangular shaped case 110. On the lower surface of case 110, a single attachment portion 110a which extends downwards may be provided, and on the upper surface of case 110, a pair of attachment portions 110b and 110c which extend upwards may be provided. Attachment portions 110a–110c may have through-holes 460a–460c formed therethrough, which mate with rod components 512a–512c, respectively, of first cast component 210. Further, by mating through-holes 460a–460c with rod components 512a–512c, respectively, it is possible to align ink reservoir 100 within external case 200.

[0028] An ink chamber 111 may be provided in substantially the entire space within case 110 except for communication path 116, an air intake path 117, and a translucent portion 140. Ink may be stored within ink chamber 111. Such ink may have light-permeability properties, and may be supplied to printer 1000 from communication path 116. Specifically, communication path 116 may be in fluid communication with ink chamber 111 and ink supply portion 120, and may be configured to dispense ink from an interior of ink chamber 111 to an exterior of ink chamber 111 via an opening formed in ink supply portion 120. Communication path 116 may be substantially perpendicular to the wall on which ink supply portion 120, air intake portion 130, and translucent portion 140 are formed, and communication path 116 may have a center line C.

[0029] In an embodiment of the present invention, translucent portion 140 may protrude leftwards in the central portion in the vertical direction of side wall 161 on the left side of ink chamber 111. Inside translucent portion 140, an inner space 140a may be formed, which may communicate with ink chamber 111. Translucent portion 140 may be positioned between light emitting portion 1014a and light receiving portion 1014b of optical sensor 1014 when ink cartridge 1 is installed in printer 1000. Light emitting portion 1014a and light receiving portion 1014b may be positioned on the front side and the back side of Figure 3. Translucent portion 140 may have light-permeable properties, e.g., may be translucent or transparent, and when the light emitted from light emitting portion 1014a is not blocked by light blocking portion 42, the light is received by light receiving portion 1014b.

[0030] A shutter mechanism 30 may be provided inside ink chamber 111. Shutter mechanism 30 may comprise a support member 31 and a rotating member 32. Rotating member 32 may comprise a resin material having a specific gravity which is less that the specific gravity of the ink within ink chamber 111, and the mass per unit volume of the resin material may be less than the mass per unit volume of the ink within ink chamber 111. Support member 31 may extend perpendicularly from the bottom surface of ink chamber 111, and may support rotating member 32, such that support rotating member 32 may rotate. Rotating member 32 may comprise an arm portion 41, a light blocking portion 42, a float portion 43, and a branched arm portion 44, and float portion 42 may be positioned closer to the bottom surface of ink chamber 111 than light blocking portion 42 is positioned to the bottom surface of ink cartridge 111. Arm portion 41 may be rotatably supported at fulcrum 41a, e.g., a pivot portion, in a support portion provided in support member 31. Fulcrum 41a may be formed at the right end of arm portion 41. Arm portion 41 may extend from fulcrum 41a towards the left upper side of Figure 3 to translucent portion 140. Light blocking portion 42 may be connected to the left end of arm portion 41, and may be positioned within inner space 140a of translucent portion 140. Further, light blocking portion 42 may be configured to block the light that is emitted from light emitting portion 1014a of the optical sensor 1014, and that permeates translucent portion 140 when positioned within inner space 140a. In addition, branched arm portion 44 branches and protrudes from the portion of arm portion 41 which is located between fulcrum 41a and light blocking portion 42, and branched arm portion may protrude towards the bottom side of ink chamber 111. Float portion 43 may be positioned on the end of branched arm portion 44, and the volume of float portion 43 may be greater than, e.g., substantially greater than, the other portions of rotating member 32. Float portion 43 may have a cavity inside in which air is packed, and the mass per unit volume including the air inside may be less than the mass per unit volume of the other portions of rotating member 32. Moreover, in an embodiment of the present invention, float portion 43 is unaligned with center line C of communication path 116 regardless of the position of float 43 within ink chamber 111.

[0031] When there is a sufficient amount of ink within ink chamber 111, because the buoyancy generated on rotating member 32 is greater than the gravity generated on rotating member 32, a clockwise moment about fulcrum 41a in Figure 3 acts on rotating member 32, and arm portion 41 rotates in a clockwise direction about fulcrum 41a along with light blocking